

Does Knowledge Management enhance Decision-Making Speed?

Daniele Giampaoli¹, Massimo Ciambotti¹

¹Urbino University, Urbino, Italy

daniele.giampaoli@uniurb.it

massimo.ciambotti@uniurb.it

Abstract: Every manager has to make daily decisions the efficacy of which will affect firm performance and so decision-making (DM) and problem-solving (PS) are very important skills able to make the difference between the success and the failure of a firm. At the same time markets have reached such a level of complexity that uncertainty and risk connected to decisions are higher than ever before while market turbulence forces firms to make faster and faster decisions in order to quickly adapt to the changing environment. For this reason time and knowledge are strictly connected resources. Speedy decisions in fact allow firms to adopt new technology or to take advantage of new market opportunities before competitors do so. According to several scholars knowledge management (KM) seems very useful to improve DM and PS processes. However, to date, few studies have investigated the impact that KM practices have on decision speed and efficacy. Therefore the present paper aims to empirically prove the impact that KM has on the organizational decision-making process and how this, in turn, impacts on firm performance. We collected survey data from 113 leading Italian companies and tested the structural model with Partial Least Square (PLS) method. Results, suggest that some KM practices significantly impact on the firm's ability to make speedy and effective decisions and also on firm performance. A very interesting result is the fact that the firm's ability to make speedy and effective decisions does not impact on firm performance. The main limitations of the present paper concern the fact that it has not been possible to stratify problem solving skills by hierarchical levels (i.e., strategic, tactical, operational) and the generalizability of results, considering that the data was collected from one single European country.

Keywords: Knowledge Management, Decision-Making Speed, Problem-Solving Speed, Performance

1. Introduction

Global markets and technological development are increasing competition among firms and creating a very turbulent and dynamic environment. Therefore, if on one hand firms need to make quicker decisions than in the past in order to survive and grow (Zehir and Ozsahin, 2008) on the other hand nowadays it is more complex to make decisions than in the past. This is due to the huge amount of information organizations have to acquire and process and little time available to do it (Hodgkinson et al., 2009).

Considering that knowledge is at the base of decisions that every manager has to make each day and that will impact on firm performance (Daft, 2008) it is quite obvious that in modern economy different performance among firms can strongly depend on the way they manage knowledge (Massingham and Massingham, 2014). Only if the right knowledge comes to the right people at the right time is it possible to make sound and speedy decisions that will impact on firm performance (Giampaoli et al., 2017).

Several researches have empirically investigated the supposed link between decision speed and firm performance but results are contrasting. Eisenhardt (1989) and Judge and Miller (1991) found that in a turbulent environment the most successful firms are those able to decide faster than competitors. Baum and Wally (2003) conducted a study on 318 CEOs and found that decision speed impacts on sales growth and profit. The study of Zehir and Ozsahin (2008) shows that speedy decisions have a positive impact on innovation performance and finally Forbes (2001) found no linkage between decision speed and performance at all.

Even though speedy decisions can provide many benefits to develop such a capability could be more difficult than expected. Some scholars found that time pressure enhances information processing of individuals (Edland, 1994) but at the same time task performance could be worse (Payne et al., 1996). Also at the organizational level results are quite contrasting (Waller et al., 2002). For this reason it is very important to understand which factors enable a fast and effective decision making process.

The present paper aims to fill this void by empirically testing the impact that knowledge management practices have on a speedy and effective decision making process and how this, in turn, impacts on firm performance.

2. Knowledge management and decision speed

In the present paper we adopted the definition of knowledge management introduced by O'Dell (1998) according to whom knowledge management is a *"a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance"*. She underlines the close link between knowledge and action whereas according to Peter Gray (2001) *"knowledge can generate economic value when it is used to solve problems,*

explore opportunities and make decisions. Understanding the contribution of various knowledge management practices to problem solving may help integrate the diverse thinking in this area”.

Boder (2006) uses the term “*collective intelligence*” to describe the process through which people, formal and informal networks, norms and organizational culture contribute to create useful knowledge for problem solving that, from a cognitive perspective, consists of information analysis and transformation to reach a specific goal (Anderson, 1980; Lovett, 2003).

Many scholars have highlighted the importance that knowledge management has on decision-making (Ragab and Arisha, 2013) while Giampaoli et al. (2017) empirically proved the positive impact that knowledge management infrastructure has on both decision quality and speed. It is therefore evident that knowledge and time are two strongly connected resources (Ragab and Arisha, 2013).

According to Huber and McDaniel (1986) decision-making and problem solving are roughly the same while Daft’s (2008) defines organizational decision-making as “*the process of identifying and solving problems*”. Daft’s definition, other than considering the decision-making process of problem identification also includes decision efficacy. The decision taken, in fact, has to solve the problem. This, from an organizational point of view, led us to consider decision-making and problem-solving are essentially the same thing. Both problem identification and solution phases can involve several departments and even more organizations. A speedy organizational decision-making process may allow firms to improve competitive performance by adopting new technologies able to enhance effectiveness and efficiency (Baum, 2000) or new products or business models (Jones, 2001). Regardless of environmental turbulence the speed of decisions may enable firms to exploit new opportunities before they vanish (Stevenson and Gumpert, 1985). At the same time fast decisions made sacrificing the quality and the quantity of useful information may lead to bad decisions and negative performance (Kahneman *et al.*, 1982). That is why it is very important to focus on the effectiveness of decisions and not only on the decision speed. Fast but ineffective decisions may be very counter-productive (Daft, 2008). Even if speedy decisions do not allow accurate analysis of the available information there are some circumstances where it is better just to decide. In fact when it is not possible to gather further useful information and decision quality cannot be improved there is no reason to delay the decision (Baum and Wally, 2003).

Considering the trade-off between decision accuracy (and therefore quality) and decision speed, more and more decision theorists have tried to understand which factors allow firms to make speedy and effective decisions (Dane and Pratt, 2007). Intuition is often considered as the solution to such a problem. Anyway it has to be underlined that intuition could favour the speed of the decision at the expense of its quality (Dane and Pratt, 2007).

Recently Giampaoli et al. (2017) found a very strong correlation (66.4%) between decision quality (creative problem solving) and decision speed (problem solving speed). It seems that firms able to make creative decisions are also able to make them speedily. This correlation is very interesting because it shows that decision quality and decision speed are not necessarily in contrast. Furthermore they empirically proved the strong positive impact that a firm’s knowledge management infrastructure has on both decision quality and speed. It seems plausible to suppose that intuition is not the only solution for managers that have to make speedy decisions. An effective knowledge management infrastructure can strongly enhance the firm’s ability to solve problems in an effective and fast way. That is why it is very important to analyze which factors enable a speedy and effective decision making process.

Daft (2008) claims that if we want to study organizational decision-making we have to analyze the turbulence of the environment and the internal structure of organizations. We chose to focus on internal structure of organizations because this kind of factors is under managerial control. Many organization theorists and strategic management researchers claim that the decision-making process depends on organizational characteristics such as centralization, formalization and complexity (Fredrickson, 1986; Pugh *et al.*, 1969; Sutcliffe and McNamara, 2011). This last one can be weighed by the firm’s size, a surrogate of organizational complexity, because as the number of employees increases, so complexity rises (Baum and Wally, 2003). Organizations with centralized strategic decision making authority within top management are probably able to make fast decisions thanks to the reduction of time required to achieve consensus. At the same time, thanks to a decentralized operations management it is possible to gather front-line environmental information useful for making decisions (Baum and Wally, 2003). Furthermore, to decentralize also means to motivate employees and increase their efficiency which enables a rapid implementation of strategic decisions (Duhaime and Schwenk, 1985).

According to bounded rationality theory cognitive skills of individuals are limited and they are not able to acquire and process huge amounts of information. Consequently when facing complex problems people need

to collaborate and share their knowledge in order to reach their goals (Nickerson and Zenger, 2004). Cabrera and Cabrera (2005) identified several organizational variables, such as culture, work design and ICT, that have a positive impact on knowledge sharing within organizations.

Considering the above we hypothesized that:

1. There is a positive direct relationship between work design and problem solving speed;
2. There is a positive direct relationship between work design and organizational performance;
3. There is a positive direct relationship between organizational culture and problem solving speed;
4. There is a positive direct relationship between organizational culture and organizational performance;
5. There is a positive direct relationship between ICT and problem solving speed;
6. There is a positive direct relationship between ICT and problem organizational culture;
7. There is a positive direct relationship between decentralization and problem solving speed;
8. There is a positive direct relationship between decentralization and organizational performance;
9. There is a positive direct relationship between problem solving speed and organizational performance;

The hypothesis are showed in Figure 1.

RESEARCH MODEL

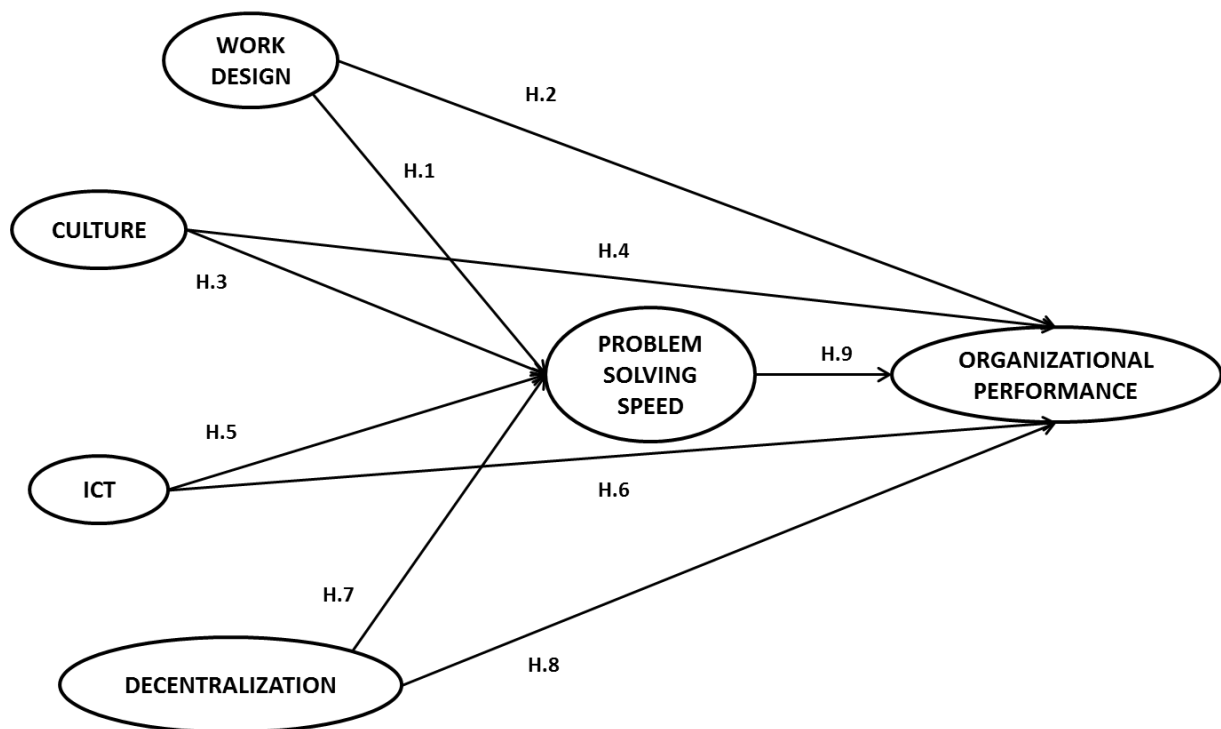


Figure 1: Research model

3. Research Methodology

3.1 Data collection, sample and survey development

In this paper we use the same sample of Giampaoli et al. (2017) where knowledge management infrastructure include six variables (work design, training, reward, organizational culture, ICT, decentralization). After analyzing the impact that each single KMI variable has on problem-solving speed and organizational performance we chose to focus only on the three with a significant impact. Anyway, considering that this paper specifically focuses on decision-making speed we thought it would have been interesting also to investigate decentralization (of decision-making process).

Survey data was collected from top Italian companies from January to March 2015. We decided to focus on top firms because they are more likely to have implemented knowledge management practices (Gold et al., 2001) and some years of valuable experience (Wu and Chen, 2014).

We sent an email to each firm of the sample as listed by Mediobanca inviting them to take part in the survey. In order to increase the number of respondents we promised them the full data report once terminated. The questionnaire was formulated in a way that any manager or managerial level employee were able to participate to enlarge the potential sample. Out of 2381 firms only 113 took part in the research, about 5%. The percentage is consistent with this kind of survey (Andreeva and Kianto, 2012). No questionnaire was excluded because they were fully filled in. Around 54.5% of the respondents were top or middle managers while the remaining 45.5% covered a role of responsibility in finance, planning and control, human resource management or were managerial level employees. The main sectors were manufacture (34%), finance and insurance (25%), other services (13.4%) construction (10%).

We developed the questionnaire in three phases. In the first one variables and items were chosen and adapted from literature and used to compose a draft questionnaire. Then we sent the draft to a full professor of knowledge management and innovation and to five CKOs. They all gave precious feedback. In the third phase an amendment draft was raised according to their guidelines and once again sent to them for a further feedback. Having only positive feedbacks this version became the final one.

3.2 Measures

To be sure that the initial scales and survey questions were corresponding one of the authors of the present paper translated the scales from English to Italian. In the second step the scales were translated back into English by a PhD student. Finally, the both Italian and English scales were checked by a bilingual speaker that found them decisively correspondent (Brislin, 1970). All the latent variables and their respective items are showed in table 1.

Work design was covered by four items that were based on conceptual consideration from Cabrera and Cabrera (2005) or taken from Donate and Guadamillas (2011). Organizational culture was investigating using four items based on conceptual consideration from Cabrera and Cabrera (2005) or taken from Lopez et al. (2004) and Kamhawi (2012). ICT was covered by four items that were taken and adapted from previous works of Andreeva and Kianto (2012) and Lee and Choi (2003). Decentralization was covered by four items that were taken and adapted from previous works of Lee and Choi (2003) and Kamhawi (2012). Problem solving speed (PSS) was covered by three items that were taken or based on conceptual consideration from previous works of Atuahene-Gima and Wei (2011). Organizational performance (OP) was covered by five items taken and adapted from previous works of Gold et al. (2001).

Table 1: Items for variable

<i>VARIABLE</i>	<i>ITEMS</i>
	<i>Work design</i>
WD1	... there are regular teams appointed with responsibility of reach goals and solve problems
WD2	... there are regular interdisciplinary teams appointed with responsibility of reaching goals and solve problems
WD3	... individual employees and/or teams with similar aims or problem to solve discuss, share ideas and give reciprocally advices
WD4	... there are specific mechanisms that assure the involvement of employees in solving problems
	<i>Organizational culture</i>
CU1	... an environment of trust and collaboration is encouraged
CU2	... employees who experiment and take reasonable risks are well considered even if they should be mistaken
CU3	... innovation and experimentation of new ways of doing tasks is encouraged
CU4	... employees are always concerned with getting the job done, with great emphasis on goal achievement

	<i>ICT</i>
ICT1	... the ict we utilize enable collaboration and cooperation
ICT2	.. the ict we utilize allows a fast and easy access to stored information and knowledge
ICT3	... the ict we utilize allows sharing of information and knowledge with suppliers, clients, partners and other stakeholders
ICT4	... we utilize software tools for decision making
	<i>Decentralization</i>
DE1	... employees are encouraged to make autonomous decisions
DE2	... employees can perform their activities without interference of superiors
DE3	... decision-making authority is delegated to those employees who actually perform task
DE4	... a formal work environment is supported
	<i>Problem solving speed</i>
PSS1	... we are fast in finding right information and knowledge necessary to solve problems
PSS2	... we are fast in finding solutions to problems
PSS3	... we are fast in implementing solutions to problems
	<i>Organizational performance</i>
OP1	... productivity is ...
OP2	... the capability to develop new products/services is ...
OP3	... the capability to respond to new market demands is improved
OP4	... the capability to capture new business opportunities is ..
OP5	... time to market ...

4. Results

4.1 Internal consistency reliability, convergent validity and divergent validity

We assessed the psychometric properties of scales in terms of reliability, convergent validity and discriminant validity. The reliability of the inherent variables and individual item is tested using Cronbach's Alpha ($\alpha \geq 0.7$) and Dillon-Goldstein's rho ($\rho \geq 0.7$) (Hair *et al*, 2010). Only 1 item was dropped. All the factor loading exceeded the recommended threshold (table 2) confirming that measurement scales have adequate convergent validity (Hair *et al*, 2010). Discriminant validity requires that the inter-correlations among the latent variables do not exceed the square root of the AVE (Chin, 1998). The correlation matrix (Table n°3) indicates that the square roots of AVE displayed on the diagonal are greater than the corresponding off-diagonal inter-construct correlations, providing good evidence of discriminant validity.

Table 2: Reliability and convergent validity

Reliability and convergent validity				
<i>Inherent variables</i>	<i>Items</i>	<i>Loadings</i>	<i>Dillon-Goldstein rho</i>	<i>Cronbach's alpha</i>
Work design	WD1	0,914	0,914	0,939
	WD2	0,897		
	WD3	0,881		
	WD4	0,872		
Culture	CU1	0,882	0,874	0,914
	CU2	0,878		
	CU3	0,893		
	CU4	0,753		
ICT	IT1	0,907	0,890	0,924

	IT2	0,900		
	IT3	0,851		
	IT4	0,808		
Decentralization	DE1	0,893	0,806	0,885
	DE2	0,746		
	DE3	0,898		
Problem solving speed	PSS1	0,872	0,878	0,925
	PSS2	0,922		
	PSS3	0,894		
Organizational performance	OP1	0,837	0,905	0,930
	OP2	0,911		
	OP3	0,889		
	OP4	0,861		
	OP5	0,759		

Table 3: Correlation matrix

Correlation Matrix						
Variable	CUL	DEC	ICT	OP	PSS	WD
CUL	0,85					
DEC	0,79	0,85				
ICT	0,61	0,57	0,87			
OP	0,55	0,40	0,36	0,85		
PSS	0,60	0,52	0,53	0,39	0,90	
WD	0,73	0,65	0,61	0,51	0,59	0,89

4.2 Testing of hypothesis

To test the research model we used Partial Least Square (SMARTPLS – 3.2.4), a structural equation modeling technique widely used in studies investigating KM's impact on performance (Ragab and Arisha, 2013) following the procedure suggested by Chin (1998). PLS can manage complex relations and places minimal demands on sample size (Chin, 1998). Considering that PLS requires ten times the number of indicators associated with the most complex construct or the largest number of antecedent constructs linking to an endogenous construct (Hair *et al*, 2010) the present research model would have been valid with 40 responses. In our case there were 113 and the sample is adequate to test the hypothesis and results are reliable. Figure 2 shows the results of the structural model.

5. Discussion

We found good parameters for all latent variables: R^2 for problem solving speed =0.43; R^2 for organizational performance = 0.33 seems satisfactory considering the numerous factors that impact on it.

H.1 WD -> PSS: As we hypothesized work design has a positive impact ($\beta=0.26$) on a firm's ability to solve problem speedily.

H.2 WD -> OP: evidence support H2 ($\beta=0.26$). Work design has a positive impact on organizational performance.

H.3 CUL -> PSS: evidence support H3 ($\beta=0.26$) confirming that organizational culture is very important to stimulate collaboration and knowledge sharing among employees so that organization are able to solve problem speedily.

H.4 CUL -> OP: findings support H4. Organizational culture has a strong positive direct impact ($\beta=0.45$) on organizational performance.

H.5 ICT -> PSS: evidence seems to support H5 ($\beta=0.19$). ICT has a weak direct impact on problem solving speed. ICTs able to support employees in daily activity improve the ability to solve problem speedily.

H.6 ICT -> OP, H.7 DEC -> PSS and H.8 DEC -> OP are not supported. Decentralization does not affect decision speed and organizational performance. This is in contrast with empirical results of Baum and Wally (2003). Moreover even ICT have no impact on organizational performance.

H.9 PSS -> OP: H9 the fact that H9 is not supported is probably the most interesting finding. Giampaoli et al. (2017) claim that a possible explanation concern the fact that the notion of “right time” does not only mean “quickly” but also “timing”. Therefore “it is possible to claim that what really matters is to have the right knowledge when we need it, not before or after. In fact, we use the right knowledge only in the moment we need it to reach our goals”.

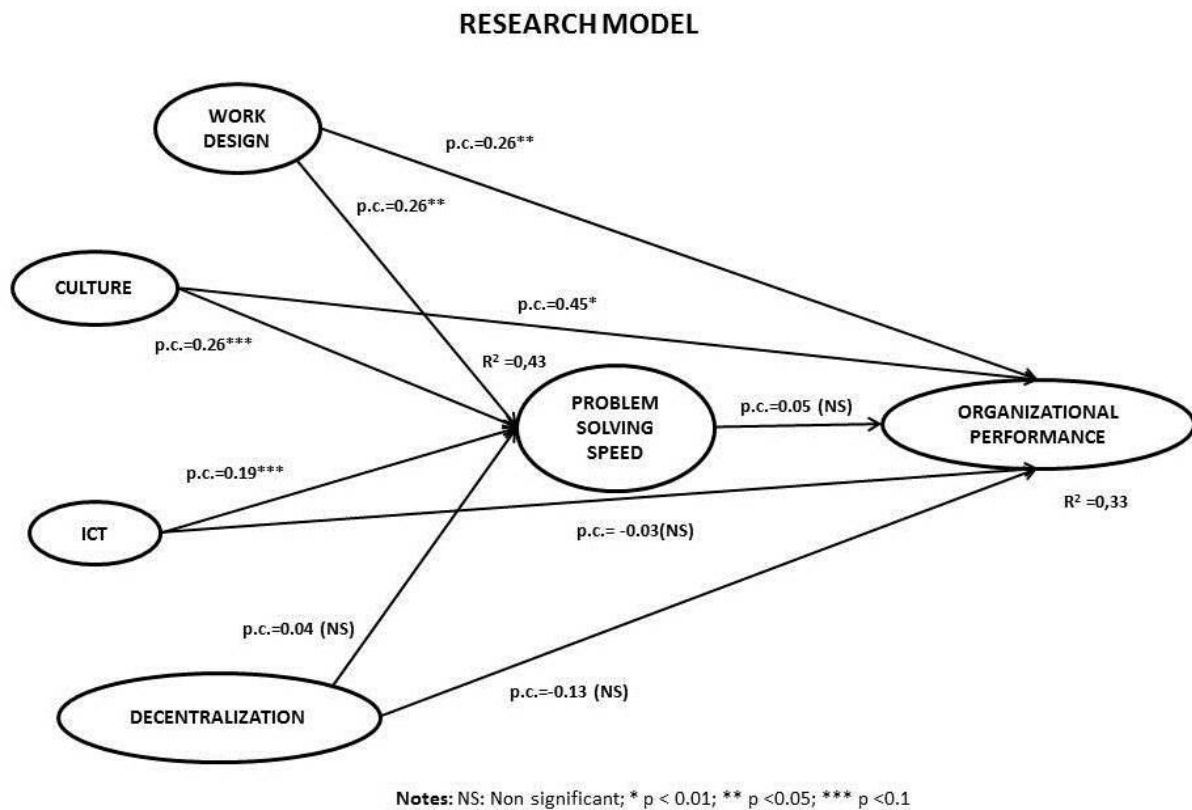


Figure 2: Test of structural model

6. Conclusion

This paper shed light on the impact that knowledge management practices have on a speedy and effective decision-making process and how this, in turn, impact on organizational performance. Organizational culture and work design have a positive direct impact on a firm’s ability to solve problem speedily while ICT has only a weak impact and decentralization no impact at all on problem solving speed. Results are very similar as far as the impact of these variables on performance is concerned. Organizational culture and work design have also in this case a positive direct impact on performance while ICT and decentralization have no impact at all. The main interesting result is probably that the firm’s ability to make speedy and effective decisions does not impact on firm performance. The fact that several of the previous studies took into consideration only decision speed excluding decision efficacy could have been the reason why results were contrasting. Unfortunately, considering both decision speed and efficacy, does not help us to clarify the issue.

Summarizing results show that knowledge management practices can speed organizational decision-making process and support literature regarding the positive impact that knowledge management has on firm performance. Organizations operating in turbulent and dynamic environment with managers forced to make speedy decisions could therefore rely on the benefit that effective knowledge management practices is able to provide. Relying on managers’ intuition will not be the only way to decide faster than competitor anymore. For firms that still have to invest in knowledge management these findings can help to understand which practices to favour in order to reach their goals.

The main limitation of the present paper concerns the generalizability of results, considering that the data was collected from one single European country.

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